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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,845	11/25/2003	Brian J. McNamara	00P 7673 US 02	8177

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EXAMINER	
LY, NGHI H	
ART UNIT	PAPER NUMBER
2617	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,845	MCNAMARA ET AL.	
	Examiner	Art Unit	
	Nghi H. Ly	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13 and 15-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13 and 15-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 13, 21 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 13, 21 and 22, the newly added limitations recite "*oscillates with a first high period and a first low period*" and "*during a first high period and a first low period*". Therefore, the claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 13, 15, 17, 20-24, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irie (JP411205043A) in view of Heck (US 5,548,840) and further in view of Dobrovolny (US 5,280,648).

Regarding claims 13, 21 and 22, Irie teaches a dual band mixer (see TECHNICAL FIELD, see MEANS, [0008] and [0024]) the second radio frequency input signal operating at a different radio frequency band than the first radio frequency input signal (see TECHNICAL FIELD, see MEANS, [0024]).

Erie does not specifically disclose a mixer, comprising: a first transistor to mix a first local oscillator input signal that oscillates with a first high period and a first low period with a first radio frequency input signal, a second transistor to mix a second local

oscillator input signal with a second radio frequency input signal that oscillates with a first high period and a first low period.

Heck teaches a mixer (see Title), comprising: a first transistor to mix a first local oscillator input signal that oscillates with a first high period and a first low period with a first radio frequency input signal (see gig.1 and fig.3 and see column 1, lines 42-47. In addition, applicant's specification fails to further define what "a first high period and a first low period" is. Therefore, Heck does indeed teach applicant's claimed limitation with a broadest reasonable interpretation. In addition, see the rejection under 35 U.S.C. 112, first paragraph above), a second transistor to mix a second local oscillator input signal with a second radio frequency input signal that oscillates with a first high period and a first low period (see gig.1 and fig.3 and see column 1, lines 42-47. In addition, applicant's specification fails to further define what "a first high period and a first low period" is. Therefore, Heck does indeed teach applicant's claimed limitation with a broadest reasonable interpretation. In addition, see the rejection under 35 U.S.C. 112, first paragraph above).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to provide the above teaching of Heck into the system of in order to balance radio frequency input (see Heck, column 1, lines 45-49).

The combination of Irie and Heck does not specifically disclose a common node for at least **one** of the first radio frequency input signal and the second radio frequency input signal and an intermediate frequency output-signal, wherein drains of the first and second transistors are coupled to the common node and interconnection circuitry to turn

off the second transistor when the first local oscillator input signal is applied to the first transistor during the first high period and a first low period and to turn off the first transistor when the second local oscillator input signal is applied to the second transistor during the first high period and a first low period.

Dobrovolny teaches a common node (see fig.1, a node 18) for at least **one** of the first radio frequency input signal and the second radio frequency input signal and an intermediate frequency output-signal (see fig.2, see "IF OUT"), wherein drains of the first and second transistors are coupled to the common node (see fig.1, the drain "D" of transistors 22 and 26 are connected at a node 18) and interconnection circuitry to turn off the second transistor when the first local oscillator input signal is applied to the first transistor during the first high period (see fig.2, LO 40 with switches 22' and 26', and negative and positive voltages. In addition, applicant's specification fails to further define what "a first high period and a first low period" is. Therefore, Dobrovolny does indeed teach applicant's claimed limitation with a broadest reasonable interpretation. In addition, see the rejection under 35 U.S.C. 112, first paragraph above) and a first low period and to turn off the first transistor when the second local oscillator input signal is applied to the second transistor during the first high period and a first low period (see fig.2, LO 40 with switches 22' and 26', and negative and positive voltages. In addition, applicant's specification fails to further define what "a first high period and a first low period" is. Therefore, Dobrovolny does indeed teach applicant's claimed limitation with a broadest reasonable interpretation. In addition, see the rejection under 35 U.S.C. 112, first paragraph above).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to provide the above teaching of Dobrovolny into the system of Irie and Heck in order to provide an improved high level resistive mixer (see Dobrovolny, column 2, lines 16-21).

Regarding claims 15 and 24, the combination of Irie, Heck and Dobrovolny further teaches the first and second transistors are field effect transistors (see Dobrovolny, Abstract, see "FET").

Regarding claim 17, the combination of Irie, Heck and Dobrovolny further teaches the interconnection circuitry includes a first network associated with the first transistor to generate a first negative voltage at a first node when the first local oscillator signal is applied to the gate of the first transistor and a second network associated with the second transistor to generate a second negative voltage at a second node when the second local oscillator signal is applied to the gate of the second transistor (see Heck, fig.2, see negative and positive volts).

Regarding claim 20, the combination of Irie, Heck and Dobrovolny further teaches a common line coupling the first and second nodes (see Dobrovolny, fig.2, the connection between two nodes under resistors 50 and 51).

Regarding claim 23, the combination of Irie, Heck and Dobrovolny teaches the plurality of transistors each have source coupled to the ground (see Dobrovolny, fig.1, the source "S" of transistors 22 and 26 connect with ground).

Regarding claim 26, the combination of Irie, Heck and Dobrovolny further teaches the circuitry does not require an external voltage source (see Dobrovolny, fig.1).

Regarding claim 27, the combination of Irie, Heck and Dobrovolny further teaches generating a first negative voltage at a first node when the first local oscillator signal is applied to the gate of the first transistor (see Heck, fig.2, negative and positive voltages), the first negative voltage to deactivate the second transistor (see Heck, fig.2, negative and positive voltages), and generating a second negative voltage at a second node when the second local oscillator signal is applied to the gate of the second transistor, the second negative voltage to deactivate the first transistor (see Heck, fig.2, negative and positive voltages).

6. Claims 16 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irie (JP411205043A) in view of Heck (US 5,548,840) and further in view of Dobrovolny (US 5,280,648) and Andrys et al (US 6,057,714).

Regarding claims 16 and 25, the combination of Irie, Heck and Dobrovolny teaches claims 15 and 24. The combination of Irie, Heck and Dobrovolny does not specifically disclose the first and second transistors are depletion-type transistors.

Andrys teaches the first and second transistors are depletion-type transistors (see column 4, lines 17-20).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to provide the above teaching of Andrys into the system of Irie,

Heck and Dobrovolny in order to provide balance on all ports in a communicating ring (see Andrys, column 4, lines 17-20).

7. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irie (JP411205043A) in view of Heck (US 5,548,840) and further in view of Dobrovolny (US 5,280,648) and Murtojarvi (US 5,678,224).

Regarding claims 18 and 19, the combination of Irie, Heck and Dobrovolny teaches claims 13 and 17. The combination of Irie, Heck and Dobrovolny does not specifically disclose the first network includes a first diode connected between the gate of the first transistor and the first node, and a first capacitor and a second diode connected in parallel between the source of the first transistor and the first node.

Murtojarvi teaches the first network includes a first diode connected between the gate of the first transistor and the first node, and a first capacitor and a second diode connected in parallel between the source of the first transistor and the first node (see fig.2).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to provide the above teaching of Murtojarvi into the system of Irie, Heck and Dobrovolny so that the leakage between the mixer outputs could have been minimized.

Response to Arguments

8. Applicant's arguments filed 02/13/07 have been fully considered but they are not persuasive.

On pages 6-8 of applicant's remarks, applicant argues that Dobrovolny does not teach turning off transistor 26 when an oscillating signal is applied to transistor 22 during a low period of transistor 22, Dobrovolny does not teach turning OFF transistor 22 when the LO source 40 applies an oscillating signal to transistor 26 during a low period of transistor 26.

In response, Dobrovolny teaches turning off transistors in response to application of LO oscillator input signals during a low period of transistor 22 or 26 (see fig.1, the outputs from the LO source 40 used to switch the transistors 22 and 26, and see fig.2, LO 40 with switches 22' and 26', and negative and positive voltages. In addition, applicant's specification fails to further define what "a first high period and a first low period" is. Therefore, Dobrovolny does indeed teach applicant's claimed limitation with a broadest reasonable interpretation. In addition, see the rejection under 35 U.S.C. 112, first paragraph above).

On pages 7 and 8 of applicant's remarks, applicant argues that the combination of Irie, Heck and Dobrovolny does not teach the limitations of claim 22.

In response, the combination of Irie, Heck and Dobrovolny does indeed teach the limitations of claim 22. In addition, applicant's attention is directed to the teaching Irie, Heck and Dobrovolny in claim 22 above.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nghi H. Ly whose telephone number is (571) 272-7911. The examiner can normally be reached on 8:30 am-5:30 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Appiah can be reached on (571) 272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly